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ABSTRACT

Research on comprehension and recall in reading has been limited in the past to quantitative studies of the amount of text items recalled. This paper reports on two experiments that used a qualitative measure in order to investigate the differences between fluent and less fluent comprehenders and the recall processes they use. The first experiment, involving 112 community college students and 48 Cornell University undergraduates, tested students' recall of two paragraphs, only one of which had explicitly stated logical and causal relations. Results indicated that the Cornell students were fluent readers, able to read even poorly written texts with good recall; the community college students were less fluent readers, who comprehended more when the text was well written, yet who still understood less than the fluent readers. The second experiment was designed to discover whether 32 randomly selected fluent and less fluent readers used different comprehension processes when reading. Results indicated that the comprehension processes used by each population were the same. The conclusion drawn from both experiments was that less fluent readers may not be deficient in comprehension at all, but rather may lack sufficient prior knowledge to allow comprehension to occur. (CC)

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QUALITATIVE ANALYSIS OF UNIQUELY RECALLED ITEMS

IN SUBJECTS' FREE RECALLS

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In the growing volumn of research into that which is recalled after reading a text there exists a severe limitation. Researchers consistently employ one of two basic techniques for looking at the data. The first technique is one of developing a structure for the text and comparing this to the structure of the recalls. Such a text structure can have several forms. Some, like Dawes (1966), have identified "idea units" by looking at the surface structure of the text. Others, like Kintsch (1974) and Frederiksen (1975), have

created explicit rules for looking at the underlying semantic structure of the text. The second research technique is newer. This is Rumelhart's (in press) technique of scoring for gist. For this type of scoring, recalls need not be as literal to be considered acceptable.

Although both of these techniques allow one to explore only the similarities between text and recalls, one can get useful information from such an exploration. For instance, Meyer (1975) and Clements (1976) have found that people recall superordinate information much more completely than they do the same information when it is subordinated. Thorndyke (1974) has found that people recall textual content more completely when the text's macrostructure is explicitly stated and familiar. Finally, Marshall (in press) had found that people recall propositional content more completely when the inter-propositional relations are explicitly stated.

The limitations of all of these studies is that they can account for nothing more than the completeness of recall for items in the text. Because of this, the basic measure of comprehension has been the quantity of recalled information. Comprehension is not a quantitative phenomenon; however, it is a qualitative process. To understand it fully, researchers must attempt to study the process using qualitative measures.

Such measures would allow one to study those parts of subjects' recalls that differ in any way from the text and to infer from such a study the processes that could have produced these differences.

Frederiksen (1977) has developed such a measure. This is a two-way classification of the types of inferences occurring in subjects' recalls. Inferences are classified by functional contexts and by operations. One can account for the functions of inferences by (1) resolution of ambiguity, (2) resolution of anaphoric reference (3) resolution of cataphoric reference, (4) deictic inferences that point out person, place, and time, (5) topical inferences that are due to thematic organization, (6) lexical expansion or contraction, (7) connection of propositions, (8) segmentation of propositions, (9) reduction of propositions, (10) extension of propositions, and (11) pragmatic inferences relating to knowledge of the world. One can account for the classes of operations on propositions by (1) lexical operations of lexicalization or unpacking, (2) object identification that distinguishes objects from others, (3) manner identifications that distinguish actions, (4) locative identifications, (5) temporal identifications, (6) frame operations that specify information missing from propositions, (8) macro-structure operations that derive superordinate or

subordinate propositions from given propositions, (9) relative operations that specify metric and nonmetric relations among propositions, (10) truth value operations that modify the truth of a proposition, and (11) dependency operations that change or establish logical and causal relations among propositions.

With this taxonomy as a tool, it is now possible to look at the inferences that occur in a subject's recall and to develop insights from these into the processes that the (Subject) used. With such insights, it should be possible to come up with some new conclusions about the reading process.

Experiment One

Method

It was decided to investigate the differences between good and poor comprehenders. To this purpose, Marshall (1976) ran a study comparing the recalls of two populations of adult readers.

Subjects--One population of subjects was made up of 112 students enrolled in a community college summer school program. The other population was of 48 Cornell undergraduates.

Materials-- Two passages, one on the topic of graphs and the other on the topic of sonnets were developed. For each, separate versions with and without explicitly stated logical and causal relations were developed. Each version contained

the same propositional content; they differed in interpropositional relations only.

Procedure--The subjects read one version of each passage and wrote free and probed recalls for both. Their recalls were scored for similarity to the text bases of the passages using Frederiksen's (1975) analysis of text structure.

Results

Not surprisingly it was found that the Cornell subjects recalled significantly more of the texts than did the community college subjects ($p < .001$). Furthermore, the community college subjects recalled significantly less of the propositional content when the logical and causal relations were not explicitly stated ($p < .05$). This manipulation made no difference in the completeness of the Cornell subjects' recalls. In fact, these tended to contain the interpropositional relations regardless of the version of the texts read whereas the recalls of the community college subjects tended to contain few if any of these relations. Another difference between the two populations showed up in the frequency of recall for various parts of the text. Both populations recalled the main idea more than all other textual information. However, the Cornell subjects recalled the details with frequencies proportional to the height of the information in the underlying hierarchical structure of the text while

the community college subjects recalled details in a more random manner. Smiley, Oakley, Campioni, and Brown (in press) found a similar difference between good and poor readers in seventh grade.

Discussion

From these data, it was concluded that the Cornell subjects represent a population of fluent adult readers while the community college subjects represent a population of not-so-fluent readers. Fluent readers are those who can read even poorly written text with good recall. Not-so-fluent readers are those who comprehend more when text is well written, but whose recall is still not as complete as those of fluent readers.

Experiment Two

Method

Are the quantitative differences between fluent and not-so-fluent readers' recalls the result of different processes? The second study was designed to answer this question.

Subjects--The free recalls of a randomly selected subset of 16 subjects from each of the two populations from the previous study were used. Of each group of 16, eight had read versions of the text containing the logical and causal relations and the other eight read versions of the text containing none of these.

Procedure--The recalls of these subjects were analyzed for inference function and category using Frederiksen's (1977) taxonomy of inference types.

Results

The results of this new analysis show that there were no significant differences in either the inference functions or the inference operations in the recalls of either population when these were analyzed for differences using a t-test. The types of inferences appearing in subjects' recalls varied idiosyncratically rather than by population.

Discussion

From these data, it was concluded that the types of inferences that appear in subjects' recalls are the same regardless of whether the subjects' were considered fluent or not-so-fluent readers. Because the inference types were the same, it was further concluded that the basic comprehension processes used by each population were also the same.

General Discussion

By analyzing recalls for quality of response, new insights into the process of comprehension have been produced. These

insights seriously call into question the conclusions of the first study that there is a substantive difference in the processes used by fluent and not-so-fluent readers. Although a difference in the amount of information recalled did occur, no differences in the quality of inferences in recalls were found. If the only difference between recalls of the two populations is that fluent readers recall more of the text than not-so-fluent readers, as the data now suggests, then one cannot hypothesize any differences in the way these two populations process text. As a result, one should be very careful about making claims about the differences between good and poor readers based on a purely quantitative analysis of their recalls. In fact, poor comprehenders may not be deficient in comprehension at all. Instead, they may lack sufficient prior knowledge to allow for the click of comprehension to occur. Bransford and McCarrell (1974) and Anderson (1977), among others, have presented convincing evidence that comprehension cannot occur without the reader calling up the proper use of anticipatory schemata. Such a conclusion is inconsistent with the results of both studies.

New insights into any process are frequently the result of new means of measurement. Thanks to Frederiksen (1977), there is now a new means of measuring the process of compre-

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hension, and this qualitative means of measurement has produced new insights. There is much research yet to be done before the process of comprehending printed discourse will be thoroughly understood. However, the ability to analyze the quality of the subject's recall is a major advance in this area of study.

References

- Anderson, R. C. The notion of schemata and the educational enterprise. In R. C. Anderson, R. J. Spiro, & W. E. Winston (eds.), Schooling and the acquisition of knowledge. Hillsdale, N.J.: Lawrence Erlbaum, Ass., 1977.
- Bransford, J. D. and McCarrell, N. S. A sketch of a cognitive approach to comprehension. In W. B. Weimer and D. S. Palermo (eds.), Cognition and the symbolic processes. Hillsdale, N. J.: Lawrence Erlbaum Ass., 1974.
- Clements, P. Effects of staging on recall from prose. Doctoral Dissertation, Cornell University, 1976.
- Dawes, R. M. Memory and distortion of meaningful written material. British Journal of Psychology, 1966, 57, 77-86.
- Frederiksen, C. H. Inference and the structure of childrens discourse. Paper presented at the Society for Research in Child Development, 1977.
- Frederiksen, C. H. Representing logical and semantic structure acquired from discourse. Cognitive Psychology, 1975, 7, 317-458.
- Kintsch, W. The representation of meaning in memory. New York: John Wiley & Sons, 1974.
- Marshall, N. Comprehension of connected discourse: A study into the relationships between the structure of text and information recalled. Reading Research Quarterly, in press.
- Marshall, N. The structure of semantic memory for text. Doctoral dissertation, Cornell University, 1976.
- Meyer, B. J. F. The organization of prose and its effects on memory. Amsterdam: North-Holland Publishers, 1975.
- Rumelhart, D. E. Understanding and summarizing brief stories. in D. LaBerge and J. Samuels (eds.), Basic processes in reading: Perception and Comprehension. Hillsdale, N.J.: Lawrence Erlbaum Ass., in press.
- Smiley, S. S., Oakley, D. D., Campione, J. C. & Brown, A. L. Recall of thematically relevant material by adolescent good and poor readers as a function of written versus oral presentation. Journal of Educational Psychology, in press.
- Thorndyke, P. W. Cognitive structure in human story comprehension and memory. Doctoral dissertation, Stanford University, 1975.